CLAIMS

What is claimed is:

1. A formulation comprising a lipophobic therapeutic agent encapsulated in a liposome, wherein, 1) the elimination half-life of the therapeutic agent when administered to an animal as part of the formulation is at least as long as the elimination half-life of the therapeutic agent when administered to the same animal in the absence of the liposome, and wherein 2) the elimination half-life of the therapeutic agent when administered as part of the formulation is less than about 14 hours in a rat.

2. The formulation of claim 1 wherein the liposome comprises a) one or more phosphatidyl choline; b) cholesterol; and optionally c) one or more anionic phospholipids.

3. The formulation of claim 1 wherein the therapeutic agent is an analgesic, anesthetic, antiacne agent, antibiotic, antibacterial, anticancer, anticholinergic, anticoagulant, antidyskinetic, antifibrotic, antifungal, antiglaucoma agents, anti-inflammatory, antineoplastic, antiosteoporotic, antipagetic, anti-Parkinson's agent, antisporatic, antipyretic, antiseptic, antithrombotic, calcium regulator, keratolytic, or a sclerosing agent.

4. The formulation of claim 1 wherein the therapeutic agent is an anti-cancer agent, an antibiotic, a nucleoside, a nucleotide, DNA, RNA, a protein, or a peptide.

5. The formulation of claim 1 wherein the therapeutic agent is cisplatin, a cisplatin derivative, amikacin, or vancomycin.

6. The formulation of claim 2 wherein the mole ratio of phosphatidyl choline to cholesterol is from about 0.5 to 1 to about 4:1.

7. The formulation of claim 2 wherein the mole ratio of phosphatidyl choline to cholesterol is from about 1 to 1 to about 2:1

8. The formulation of claim 2 wherein the mole ratio of phosphatidyl choline to cholesterol is about 2:1.

9. The formulation of claim 2 wherein the phosphatidyl choline is selected from DEPC, DOPC, DSPC, HSPC, DMPC, and DPPC, and mixtures thereof.

10. The formulation of claim 2 wherein the phosphatidyl choline is selected from DOPC, DSPC, HSPC, DMPC, and DPPC, and mixtures thereof.

11. The formulation of claim 2 wherein the phosphatidyl choline is selected from DOPC, DSPC, HSPC, and DPPC, and mixtures thereof.

12. The formulation of claim 2 wherein the phosphatidyl choline is DEPC or DOPC.

13. The formulation of claim 1 wherein the liposome is an SUV or an MLV.

14. The formulation of claim 1 wherein the mean particle size measured by dynamic light scattering is less than about 100 nm.

15. The formulation of claim 1 wherein the animal is a mammal.

16. The formulation of claim 1 wherein the animal is a mouse, a dog or a primate.

17. The formulation of claim 1 wherein the animal is a human.

18. The formulation of claim 1 wherein the weight ratio of total lipid to therapeutic agent is greater than 5:1.

19. The formulation of claim 1 wherein the weight ratio of total lipid to therapeutic agent is greater than 10:1.

20. The formulation of claim 1 wherein the weight ratio of total lipid to therapeutic agent is greater than 20:1.

21. The formulation of claim 1 wherein the elimination half-life of the therapeutic agent when administered to an animal as part of the formulation is at least about 1.5-times as long as the elimination half-life of the therapeutic agent when administered to the same animal in the absence of the liposome.

22. The formulation of claim 1 wherein the elimination half-life of the therapeutic agent when administered to an animal as part of the formulation is at least about 2-times as long as the elimination half-life of the therapeutic agent when administered to the same animal in the absence of the liposome.

23. The formulation of claim 1 wherein the elimination half-life of the therapeutic agent when administered to an animal as part of the formulation is at least about 3-times as long as the elimination half-life of the therapeutic agent when administered to the same animal in the absence of the liposome.

24. The formulation of claim 2 wherein the liposome comprises HSPC:Cholesterol:DSPG in a ratio of about 4:1:0.1.

25. The formulation of claim 2 wherein the liposome comprises DEPC:Cholesterol in a ratio of about 2:1.

26. The formulation of claim 2 wherein the liposome comprises DEPC:Cholesterol:DSPG in a ratio of about 2:1:0.1.

27. The formulation of claim 2 wherein the liposome comprises DOPC:Cholesterol in a ratio of about 2:1.

28. The formulation of claim 2 wherein the liposome comprises DMPC:Cholesterol:DSPG in a ratio of about 2:1:0.1.

29. The formulation of any one of claims 24-28 wherein the therapeutic agent is cisplatnin.

30. The formulation of any one of claims 24-28 wherein the therapeutic agent is amikacin or vancomycin.

31. A unit dosage form comprising a formulation of claim 1.

32. The unit dosage form of claim 31, which is formulated for parenteral administration.

33. A method for improving the efficacy of a therapeutic agent comprising encapsulating the agent in a liposome, wherein, 1) the elimination half-life of the therapeutic agent when administered to an animal as part of the formulation is at

least as long as the elimination half-life of the therapeutic agent when administered to the same animal in the absence of the liposome, and wherein 2) the elimination half-life of the therapeutic agent when administered as part of the formulation is less than about 14 hours in a rat.

34. The method of claim 33 wherein the elimination half-life of the therapeutic agent when administered to an animal as part of the formulation is at least about 2-times as the elimination half-life of the therapeutic agent when administered to the same animal in the absence of the liposome,

35. A method for producing an anti-cancer effect in an animal comprising administering to the animal an effective amount of a formulation as described in claim 1 wherein the therapeutic agent is an anticancer agent. .

36. A method for producing an antibiotic effect in an animal comprising administering to the animal an effective amount of a formulation as described in claim 1 wherein the therapeutic agent is an antibiotic agent.

37. A pharmaceutical composition comprising a formulation as described in claim 1 and a pharmaceutically acceptable diluent or carrier.

38. The composition of claim 37 which is formulated for parenteral administration.